www.osram.com/ledlamps

The new class of light.

NEW RANGE

Pioneering OSRAM LED lamps for simple direct replacement in general illumination and effect lighting applications.

OSRAM LED CREATING TOMORROW

OSRAM

Welcome to the future.

LED – for OSRAM, the lighting specialist, these three letters spell the future of light. This is because high-quality OSRAM LED products are not only unbeatable in terms of their efficiency and durability, they are also incredibly versatile.

For general illumination, OSRAM LED lamps with their outstanding light are already being used as simple direct replacements for incandescent lamps up to 60 W. And as far as atmospheric lighting is concerned, the many colored and color-changing LED lamps in the OSRAM range give enormous creative freedom. The innovative LED range is rounded off with special lamps for residential properties and the entertainment industry.

So you see, the future of light has already begun – welcome to this exciting world.

A real innovation.

OSRAM LED lamps are not just modern and stylish, they have such outstanding properties that they offer a whole series of practical benefits. In terms of durability, quality of light, economy and environmental impact, LED lamps from OSRAM are truly pioneering – and, more than almost any other technology, rightly deserve the title of innovation.

The new quality standard:

- no UV or near infrared radiation
- low thermal output
- instant 100 % light
- up to 100,000 switching cycles and more
- white light with good color rendering
- warm White incandescent-like light color
- impact and vibration-proof
- available in many different designs and with different bases for simple direct replacement
- OSRAM Guarantee: Up to 5 years on LED lamps.

The new efficiency standard:

- up to 90 % energy savings compared with similar conventional incandescent lamps
- life of up to 35 years*
- direct replacement so no need to change the system
- reduced air-condition costs thanks to extremely low thermal output

The new environmental protection standard:

- up to 90 % lower CO_2 emissions compared with similar conventional incandescent and halogen lamps
- outstanding eco balance thanks to low energy requirements in production and low energy consumption in operation
- mercury-free
- less waste and low consumption of resources thanks to extremely long life

* Corresponds to an average life of 35,000 hours if used for about 2.7 hours each day

General illumination

Effect lighting

Special lighting

Example: Cost/benefit analysis for professional use – 24 months

Lamp type	CLASSIC A 60 W	PARATHOM® PRO CLASSIC A 60 (12 W)	Savings with PARATHOM® PRO
Number of lamps	1 pc.	1 pc.	
Lamp wattage	60 W	12 W	
Average lamp life	1,000 h	25,000 h	
Burning time in shop, 6 days à 11 hours	up to 3,500 h/year	up to 3,500 h/year	
Relamping costs e. g.	1.30 €/pc.	60.00 €/pc.	
Replacement costs/light source, e. g.	2.00 €/pc.	2.00 €/pc.	
Electricity costs	0.17 €/kWh	0.17 €/kWh	
CO_2 factor	0.5 kg CO_2/kWh	0.5 kg CO_2/kWh	
Connected load	0.06 kW	0.012 kW	
Hours of operation after 24 months	7,000 h	7,000 h	
Number of lamps required in that time	8 Lamps	1 Lamp	**7 Lamps**
Lamp replacement and relamping costs	26.40 €	62.00 €	
Power consumption after 24 months	420 kWh	84 kWh	**336 kWh**
Electricity costs after 24 months	71.40 €	14.28 €	
Total costs after 24 months	97.80 €	76.28 €	**21.52 €**
CO_2 emissions after 24 months	210 kg CO_2	42 kg CO_2	**168 kg CO_2**

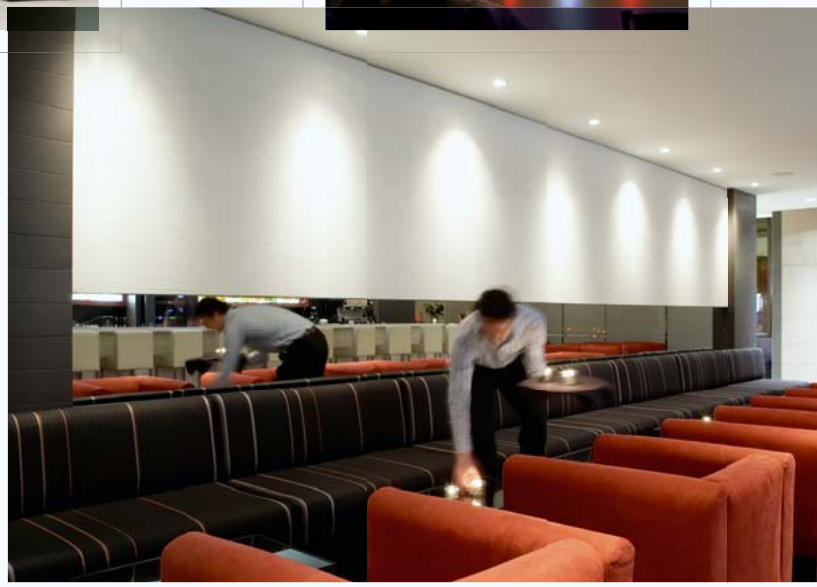
For more information on the economy of LED lamps go to: www.osram.com/ledlamps

Unbeatable in so many ways.

The OSRAM product range is so extensive that LED lamps can already be used as replacements for classic incandescent and halogen lamps in many different sectors. Whether it's the residential environment or the commercial sector, such as restaurants, leisure parks, shops or museums, LED lamps from OSRAM offer unbeatable benefits – and that goes for general illumination as well as for effect and mood lighting.

HOME.

LEDs in your own four walls: pioneering technology and a relaxing atmosphere.



HOSPITALITY.

Modern, atmospheric and extremely efficient: With PARATHOM® LED lamps restaurant owners can serve their guests the most tasteful lighting – and enjoy extremely low operating costs.

SHOP.

Perfect shop lighting: With PARATHOM® LED Reflector and Classic LED lamps you can present your products in the best light.

SPECIAL.

Amusement is their strength: In leisure parks and and at parties the durable and economical PARATHOM® DECO lamps will fascinate visitors and operators alike. And OSRAM LED lamps are also used in special applications such as refrigerator lighting.

Classic

For general illumination tasks PARATHOM® and PARATHOM® PRO LED lamps from OSRAM can replace conventional incandescent and halogen lamps up to 60 W in most applications. Two high-quality light colors are available to create the right atmosphere, namely the activating Cool White/Daylight for work rooms and incandescent-like Warm White for restful light in living rooms.

1/2 PARATHOM® CLASSIC A – 15/25/40
- *Average life of up to 25 years[1]*
- *CLASSIC A 15: suitable for indoors and outdoors*
- *Replacement options:*
  8 W incandescent lamp – CLASSIC A 15
  25 W incandescent lamp – CLASSIC A 25
  40 W incandescent lamp – CLASSIC A 40

3 PARATHOM® PRO CLASSIC A – 60/80
- *Average life of up to 25 years[1]*
- *100 % dimmable*
- *Very high luminous flux of up to 810 lm*
- *Very narrow color location*
- *Replacement options:*
  50 W incandescent lamp – PRO CLASSIC A 60
  60 W incandescent lamp – PRO CLASSIC A 80

4/5 PARATHOM® CLASSIC B – 15/25
- *Average life of up to 25 years[1]*
- *CLASSIC B 15: suitable for indoors and outdoors*
- *CLASSIC B 25: with OSRAM Golden DRAGON® Plus LED, very narrow color location*
- *Replacement options:*
  8 W incandescent lamp – CLASSIC B 15
  25 W incandescent lamp – CLASSIC B 25

6/7/8 PARATHOM® CLASSIC P – 15/25
- *Average life of up to 25 years[1]*
- *CLASSIC P 15: suitable for indoors and outdoors*
- *Replacement options:*
  8 W incandescent lamp – CLASSIC P 15
  20 W incandescent lamp – CLASSIC P 25

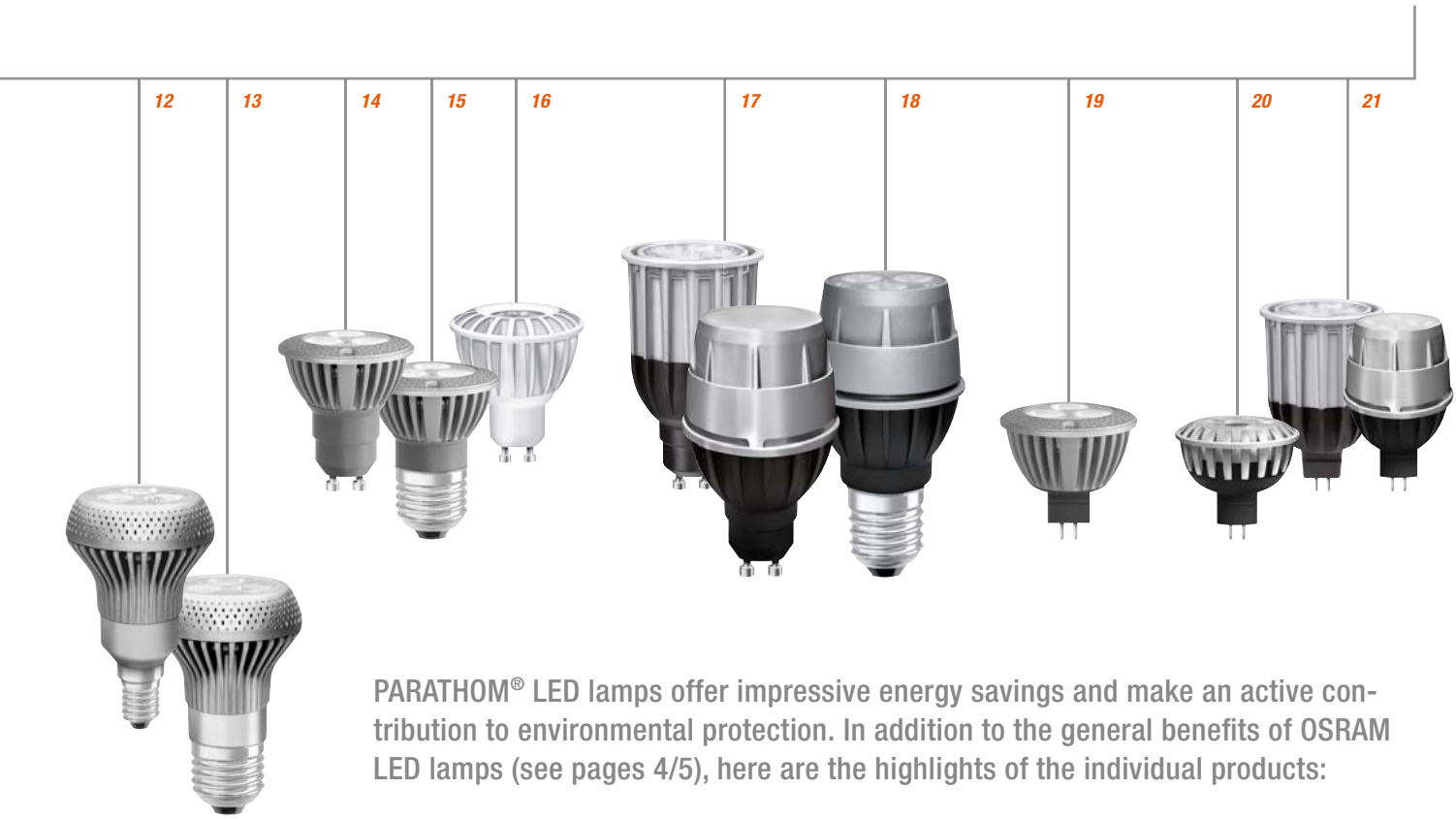
9/10 PARATHOM® Globe G95 – 15/40
- *Average life of up to 25 years[1]*
- *G95 15: suitable for indoors and outdoors*
- *G95 40: very high light output, very narrow color location and attractive design*
- *Replacement options:*
  15 W incandescent lamp – Globe 15
  40 W incandescent lamp – Globe 40

[1] Corresponds to an average life of 25,000 hours if used for about 2.7 hours each day.
[2] Corresponds to an average life of 35,000 hours if used for about 2.7 hours each day.

UP TO 90 % ENERGY SAVING

shapes, superior technology.

OSRAM LED lamps for general illumination.



PARATHOM® LED lamps offer impressive energy savings and make an active contribution to environmental protection. In addition to the general benefits of OSRAM LED lamps (see pages 4/5), here are the highlights of the individual products:

11/12 PARATHOM® R50 25 and 40
- *Average life of up to 25 years[1]*
- *Simple direct replacement thanks to the same dimensions as a standard R50 incandescent spotlight*
- *Replacement options:*
  25 W incandescent lamp – R50 25
  40 W incandescent lamp – R50 40

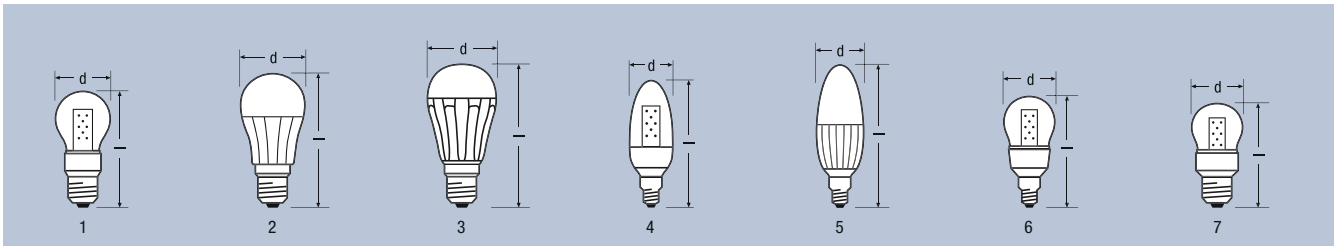
13/14/15 PARATHOM® PAR16 20 and 35
- *Average life of up to 35 years[2]*
- *Beam angle of 25° or 35°*
- *Version with GU10 base ideal for existing halogen luminaires*
- *Replacement options:*
  20 W halogen lamp – PAR16 20
  35 W halogen lamp – PAR16 35

16/17 PARATHOM® PRO PAR16 35 and 50 Advanced
- *Average life of up to 25 years[1]*
- *High light output (up to 950 cd with a beam angle of 35°)*
- *Shape corresponds to that of a standard halogen reflector lamp with a diameter of 50 mm*
- *Very narrow color location*
- *Dimmable*
- *Replacement options:*
  35 W halogen lamp – PRO PAR16 35 Advanced
  50 W halogen lamp – PRO PAR16 50 Advanced

18 PARATHOM® MR16 20
- *Average life of up to 25 years[1]*
- *Low-voltage operation on CCG and ECG*
- *Shape corresponds to that of a standard PAR20 halogen lamp with a diameter of approx. 65 mm*
- *Ideal as a replacement in existing low-voltage halogen reflector luminaires*
- *Simple replacement thanks to the same dimensions as halogen MR16 lamps*
- *Replacement options:*
  20 W halogen lamp – MR16 20

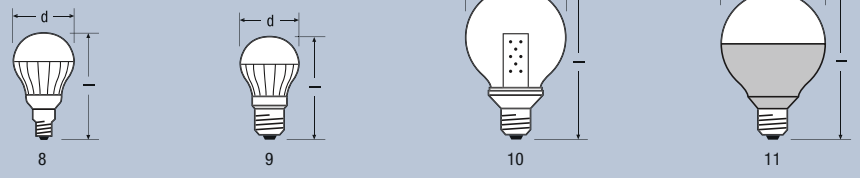
19/20 PARATHOM® PRO MR16 20 and 35 Advanced
- *Average life of up to 25 years[1]*
- *Dimmable*
- *Low-voltage operation, on CCG or ECG (also on HTM)[3] possible*
- *High light output (up to 1200 cd with a beam angle of 36°)*
- *Ideal as a replacement in existing low-voltage halogen reflector luminaires*
- *MR16 20 Advanced: simple replacement thanks to the same dimensions as halogen MR16 lamps*
- *Very narrow color location*
- *Replacement options:*
  20 W halogen lamp – PRO MR16 20 Advanced
  35 W halogen lamp – PRO MR16 35 Advanced

[3] See page 23, Know-how: Transformers.



	Product reference	Product number (EAN)		W[1]	lm[1]	cd[1]	[1]	l [mm]	d [mm]		No.
	OSRAM PARATHOM® CLASSIC A 15/25/40 and PARATHOM® PRO CLASSIC A 60/80										
	E27 – 100–240 V – Blister										
	CL A 15 (clear) CW	4008321**930231**	Cool White	2	95	–	–	109	55	6	1
	CL A 15 (clear) WW	4008321**925343**	Warm White	2	100	–	–	109	55	6	1
	CL A 25 (frosted) D	4008321**965066**	Daylight	6	365	–	–	101	55	6	2
	CL A 25 (frosted) WW	4008321**965103**	Warm White	6	290	–	–	101	55	6	2
	CL A 40 (frosted) D	4008321**952103**	Daylight	8	450	–	–	113	55	6	2
	CL A 40 (frosted) WW	4008321**952028**	Warm White	8	345/470[2]	–	–	113	55	6	2
NEW	CL A 60 (frosted) WW	4008321**965189**	Warm White	12	650	–	–	126	62	6	3
	E27 – 100–240 V – Box										
	CL A 15 (clear) CW	4008321**929273**	Cool White	2	95	–	–	109	55	10	1
	CL A 15 (clear) WW	4008321**925329**	Warm White	2	100	–	–	109	55	10	1
	CL A 25 (frosted) D	4008321**965042**	Daylight	6	365	–	–	101	55	10	2
	CL A 25 (frosted) WW	4008321**965080**	Warm White	6	290	–	–	101	55	10	2
	CL A 40 (frosted) D	4008321**952141**	Daylight	8	450	–	–	113	55	10	2
	CL A 40 (frosted) WW	4008321**952066**	Warm White	8	345/470[2]	–	–	113	55	10	2
NEW	PRO CL A 60 (frosted) WW	4008321**965165**	Warm White	12	650	–	–	126	62	10	3
NEW	PRO CL A 80 (frosted) WW	4008321**960658**	Warm White	12	810	–	–	126	62	10	3
	OSRAM PARATHOM® CLASSIC B 15/25										
	E14 – 100–240 V – Blister										
	CL B 15 (clear) CW	4008321**930279**	Cool White	1.6	63	–	–	104	35	6	4
	CL B 15 (clear) WW	4008321**925428**	Warm White	1.6	70	–	–	104	35	6	4
	CL B 25 (frosted) WW	4008321**952189**	Warm White	4	170/250[2]	–	–	117	40	6	5
	E14 – 100–240 V – Box										
	CL B 15 (clear) CW	4008321**929310**	Cool White	1.6	63	–	–	104	35	10	4
	CL B 15 (clear) WW	4008321**925404**	Warm White	1.6	70	–	–	104	35	10	4
	CL B 25 (frosted) WW	4008321**952202**	Warm White	4	170/250[2]	–	–	117	40	10	5
	OSRAM PARATHOM® CLASSIC P 15/25										
	E14 – 100–240 V – Blister										
NEW	CL P 15 (clear) WW	4008321**962515**	Warm White	1.6	70	–	–	95	45	6	6
	CL P 25 (frosted) D	4008321**965301**	Daylight	4	250	–	–	78	45	6	8
	CL P 25 (frosted) WW	4008321**965349**	Warm White	4	200	–	–	78	45	6	8
	E14 – 100–240 V – Box										
NEW	CL P 15 (clear) WW	4008321**962492**	Warm White	1.6	70	–	–	95	45	10	6
	CL P 25 (frosted) D	4008321**965288**	Daylight	4	250	–	–	78	45	10	8
	CL P 25 (frosted) WW	4008321**965325**	Warm White	4	200	–	–	78	45	10	8
	E27 – 100–240 V – Blister										
	CL P 15 (clear) CW	4008321**930255**	Cool White	1.6	63	–	–	90	45	6	7
	CL P 15 (clear) WW	4008321**925381**	Warm White	1.6	70	–	–	90	45	6	7
	CL P 25 (frosted) D	4008321**965226**	Daylight	4	250	–	–	78	45	6	9
	CL P 25 (frosted) WW	4008321**965264**	Warm White	4	200	–	–	78	45	6	9

[1] All the technical parameters apply to the entire lamp. In view of the complex manufacturing process for light emitting diodes, the typical values given above for the technical LED parameters are merely statistical values that do not necessarily correspond to the actual technical parameters of an individual product; individual products may vary from the typical values.
[2] Constant improvements in lumen.



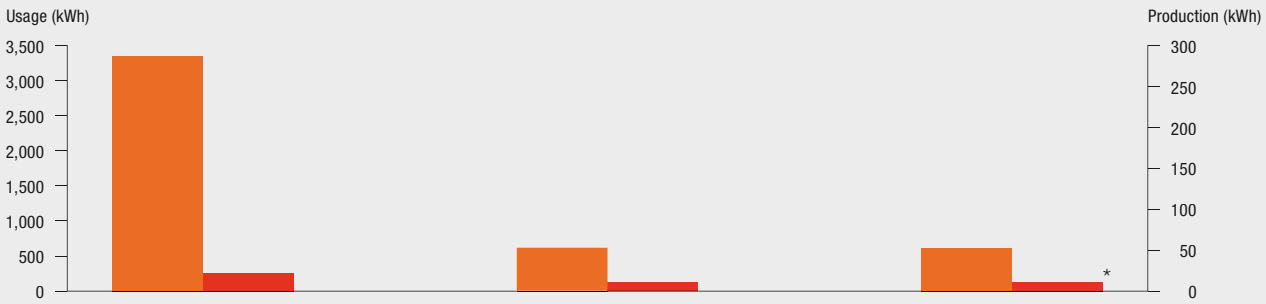
8 9 10 11

Product reference	Product number (EAN)		W [1]	lm [1]	cd [1]	[1]	l [mm]	d [mm]		No.
E27 – 100–240 V – Box										
CL P 15 (clear) CW	4008321**929297**	Cool White	1.6	63	–	–	90	45	10	7
CL P 15 (clear) WW	4008321**925367**	Warm White	1.6	70	–	–	90	45	10	7
CL P 25 (frosted) D	4008321**965202**	Daylight	4	250	–	–	78	45	10	9
CL P 25 (frosted) WW	4008321**965240**	Warm White	4	200	–	–	78	45	10	9
OSRAM PARATHOM® Globe G95 15/40										
E27 – 100–240 V – Blister										
G95 15 (clear) CW	4008321**930293**	Cool White	3	135	–	–	142	95	6	10
G95 15 (clear) WW	4008321**930316**	Warm White	3	140	–	–	142	95	6	10
E27 – 100–240 V – Box										
G95 15 (clear) CW	4008321**929334**	Cool White	3	135	–	–	142	95	10	10
G95 15 (clear) WW	4008321**929358**	Warm White	3	140	–	–	142	95	10	10
E27 – 220–240 V – Box (with Euro perforation tab)										
G95 40 (frosted) WW	4008321**965387**	Warm White	10.5	470	–	–	130	95	6	11

Pioneering also in their eco credentials.

In terms of their overall energy balance, LED lamps are on a par with energy-saving lamps and far superior to conventional incandescent lamps. This is indicated by a recent study produced by OSRAM together with experts from Siemens Corporate Technology. The study demonstrated that only 2 % of the total energy relating to an LED lamp is consumed during manufacture, the rest during operation. Thanks to their energy efficiency, which is set to improve still further, LED lamps from OSRAM are already the best choice and will only consolidate this position in future. For more information go to www.osram.com/ledlamps

Primary energy in kWh over a period of 25,000 hours.



25 incandescent lamps
CLASSIC A 40 W
Life of 1,000 hours each

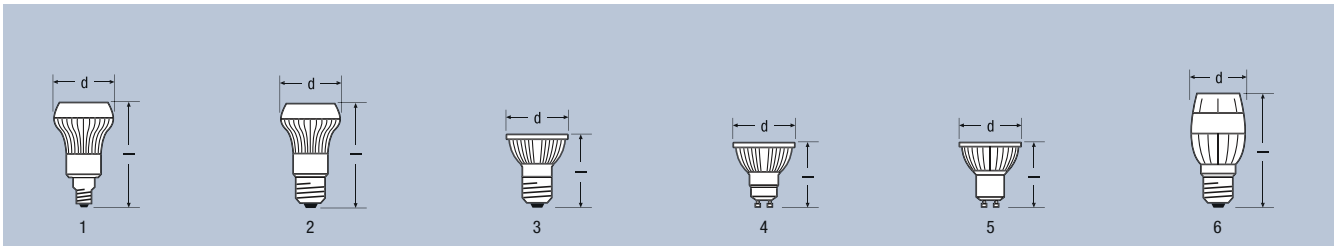
2.5 compact fluorescent lamps
Classic A 8 W energy-saving lamp
Life of 10,000 hours each

1 LED lamp
PARATHOM® CLASSIC A 40 8 W
Life of 25,000 hours each

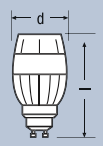
* Less than 2% of the energy is attributable to production.

Usage

Production (shown 10 times greater)



	Product reference	Product number (EAN)		W [1]	lm [1]	cd [1]	[1]	l [mm]	d [mm]		No.
OSRAM PARATHOM® R50 25/40											
E14 – 220–240 V – Blister											
	R50 25 D	4008321**965424**	Daylight	3	140	350	30°	85	50	6	1
	R50 25 WW	4008321**965462**	Warm White	3	100	250	30°	85	50	6	1
	R50 40 D	4008321**965585**	Daylight	6	240	590	30°	85	50	6	1
	R50 40 WW	4008321**965622**	Warm White	6	170	500	30°	85	50	6	1
E14 – 220–240 V – Box											
	R50 25 D	4008321**965400**	Daylight	3	140	350	30°	85	50	10	1
	R50 25 WW	4008321**965448**	Warm White	3	100	250	30°	85	50	10	1
	R50 40 D	4008321**965561**	Daylight	6	240	590	30°	85	50	10	1
	R50 40 WW	4008321**965608**	Warm White	6	170	500	30°	85	50	10	1
E27 – 220–240 V – Blister											
	R50 25 D	4008321**965509**	Daylight	3	140	350	30°	83	50	6	2
	R50 25 WW	4008321**965547**	Warm White	3	100	250	30°	83	50	6	2
	R50 40 D	4008321**965660**	Daylight	6	240	590	30°	83	50	6	2
	R50 40 WW	4008321**965707**	Warm White	6	170	500	30°	83	50	6	2
E27 – 220–240 V – Box											
	R50 25 D	4008321**965486**	Daylight	3	140	350	30°	83	50	10	2
	R50 25 WW	4008321**965523**	Warm White	3	100	250	30°	83	50	10	2
	R50 40 D	4008321**965646**	Daylight	6	240	590	30°	83	50	10	2
	R50 40 WW	4008321**965684**	Warm White	6	170	500	30°	83	50	10	2
OSRAM PARATHOM® PAR16 20/35 and PARATHOM® PRO PAR16 35/50 Advanced											
E27 – 220–240 V – Blister											
NEW	PAR16 35 25° D	4008321**980083**	Daylight	4.5	220	700	25°	68	50	6	3
NEW	PAR16 35 25° WW	4008321**980069**	Warm White	4.5	170	700	25°	68	50	6	3
E27 – 220–240 V – Box											
NEW	PAR16 20 35° D	4008321**965721**	Daylight	4.5	220	600	35°	68	50	10	3
NEW	PAR16 20 35° WW	4008321**965769**	Warm White	4.5	170	450	35°	68	50	10	3
NEW	PRO PAR16 35 Advanced Front D	4008321**964083**	Daylight	8	> 220	> 600	35°	93	50	10	6
NEW	PRO PAR16 35 Advanced Front WW	4008321**964007**	Warm White	8	220	600	35°	93	50	10	6
NEW	PRO PAR16 50 Advanced Front D	4008321**964243**	Daylight	10	450	1200	35°	93	50	10	6
NEW	PRO PAR16 50 Advanced Front WW	4008321**964168**	Warm White	10	350	950	35°	93	50	10	6
GU10 – 220–240 V – Blister											
NEW	PAR16 35 25° D	4008321**980045**	Daylight	4.5	220	700	25°	58	50	6	4
NEW	PAR16 35 25° WW	4008321**979469**	Warm White	4.5	170	700	25°	58	50	6	4



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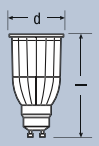

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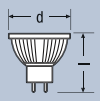

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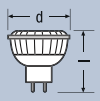

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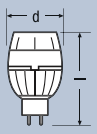

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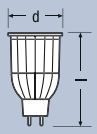

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	Product reference	Product number (EAN)		W [1]	lm [1]	cd [1]	[1]	l [mm]	d [mm]		No.
	GU10 – 220–240 V – Box										
NEW	PAR16 20 35° D	4008321**965806**	Daylight	4.5	220	600	35°	58	50	10	4
NEW	PAR16 20 35° WW	4008321**965844**	Warm White	4.5	170	450	35°	58	50	10	4
NEW	PAR16 35 35° WW	4008321**979506**	Warm White	5	220	600	35°	57	50	10	5
NEW	PRO PAR16 35 Advanced Front D	4008321**964045**	Daylight	8	> 220	> 600	35°	85	50	10	7
NEW	PRO PAR16 35 Advanced Front WW	4008321**963963**	Warm White	8	220	600	35°	85	50	10	7
NEW	PRO PAR16 35 Advanced Rear D	4008321**980168**	Daylight	8	> 220	> 600	35°	85	50	10	8
NEW	PRO PAR16 35 Advanced Rear WW	4008321**980144**	Warm White	8	220	600	35°	85	50	10	8
NEW	PRO PAR16 50 Advanced Front D	4008321**964205**	Daylight	10	450	1200	35°	85	50	10	7
NEW	PRO PAR16 50 Advanced Front WW	4008321**964120**	Warm White	10	350	950	35°	85	50	10	7
NEW	PRO PAR16 50 Advanced Rear D	4008321**980205**	Daylight	10	450	1200	35°	85	50	10	8
NEW	PRO PAR16 50 Advanced Rear WW	4008321**980182**	Warm White	10	350	950	35°	85	50	10	8
	OSRAM PARATHOM® MR16 20 and PARATHOM® PRO MR16 20/35 Advanced										
	GU5.3 – 12 V – Blister										
	MR16 20 WW	4008321**962669**	Warm White	4.5	185	450	36°	48	50	6	9
	GU5.3 – 12 V – Box										
	MR16 20 WW	4008321**521927**	Warm White	4.5	185	450	36°	48	50	6	9
NEW	PRO MR16 20 Advanced D	4008321**963840**	Daylight	5.5	> 200	> 500	36°	49	50	10	10
NEW	PRO MR16 20 Advanced WW	4008321**963802**	Warm White	5.5	200	500	36°	49	50	10	10
NEW	PRO MR16 35 Advanced Front D	4008321**963925**	Daylight	10	450	1200	36°	77	50	10	11
NEW	PRO MR16 35 Advanced Front WW	4008321**963888**	Warm White	10	350	950	36°	77	50	10	11
NEW	PRO MR16 35 Advanced Rear D	4008321**980120**	Daylight	12	450	1200	36°	77	50	10	12
NEW	PRO MR16 35 Advanced Rear WW	4008321**980106**	Warm White	12	350	950	36°	77	50	10	12

You can find suitable control gear from OSRAM (such as OTe 35/220-240/12) on the internet at **www.osram.com/optotronic**

Further information on compatibility is given on the relevant technical data sheets for the products.

[1] All the technical parameters apply to the entire lamp. In view of the complex manufacturing process for light emitting diodes, the typical values given above for the technical LED parameters are merely statistical values that do not necessarily correspond to the actual technical parameters of an individual product; individual products may vary from the typical values.

Creative

PARATHOM® DECO LED lamps for indoors and outdoors make the world a colorful place. They can be used to create a suitable atmosphere anywhere with their white, red, yellow, green and blue light and there is also a color-changing version with Color Stop technology (stop at any color simply by double-clicking the light switch). You can create special interest with the new DECO CLASSIC BA bent tip candle and the DECO CLASSIC BW twisted candle. In addition to the general benefits of OSRAM LED lamps (see pages 4/5), here are the highlights of the individual products:

1 PARATHOM® DECO CLASSIC A
- *Average life of up to 25 years[1]*
- *Suitable for indoors and outdoors*
- *Available in White, Blue, Green, Red, Yellow and Colorchange*
- *Colorchange with Color Stop technology: stop at any color simply by double-clicking the light switch*

2 PARATHOM® DECO CLASSIC B
- *Average life of up to 25 years[1]*
- *Suitable for indoors and outdoors*
- *Available in White, Blue, Green, Red, Yellow and Colorchange*
- *Colorchange with Color Stop technology: stop at any color simply by double-clicking the light switch*

3/4 PARATHOM® DECO CLASSIC BA and BW
- *Average life of up to 15 years[2]*
- *For decorative indoor lighting*
- *Bent tip candle in clear and frosted and also as a twisted version*

5/6 PARATHOM® DECO CLASSIC P
- *Average life of up to 25 years[1]*
- *Suitable for indoors and outdoors*
- *Available in White, Blue, Green, Red, Yellow and Colorchange*
- *Colorchange with Color Stop technology: stop at any color simply by double-clicking the light switch*

7 PARATHOM® DECO Globe
- *Average life of up to 25 years[1]*
- *Suitable for indoors and outdoors*
- *Available in Blue, Green, Red, Yellow and Colorchange*

mood makers.

OSRAM DECO LED lamps for effect lighting.

8 ●●●●

9 ○●●●●

10 ○●●●●

11 ○●●●●◐

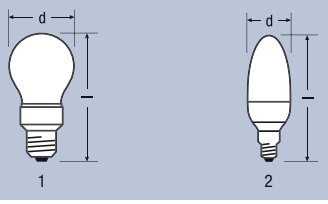
12 ○●●●●◐

8 PARATHOM® DECO R50 40
- *Average life of up to 15 years[2]*
- *Directional accent light with a beam angle of 15°*
- *Available in Blue, Green, Red and Yellow*

9/10 PARTHOM® DECO PAR16 10
- *Average life of up to 20 years[3]*
- *Directional accent light with a beam angle of 20°*
- *Available in White, Blue, Green, Red and Yellow*
- *Warm White or Daylight light color: with OSRAM Golden DRAGON® Plus LED and an average life of as much as 25 years[1]*
- *With E27 or GU10 base*

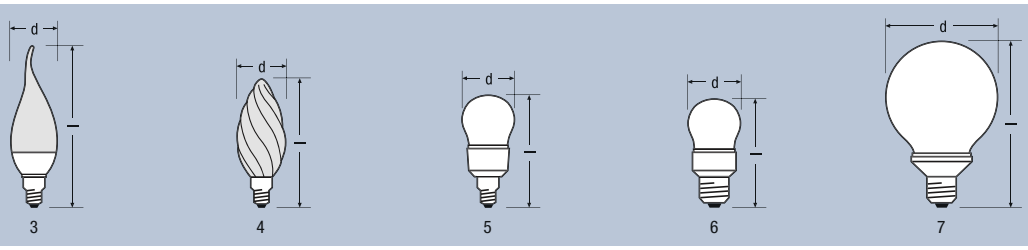
11/12 DECOSPOT® PAR16
- *Average life of up to 25 years[1]*
- *Directional accent light with a beam angle of 12°/White color 20°*
- *Available in White, Blue, Green, Red and Colorchange*
- *With E14 or GU10 base*

[1] Corresponds to an average life of 25,000 hours if used for about 2.7 hours each day.
[2] Corresponds to an average life of 15,000 hours if used for about 2.7 hours each day.
[3] Corresponds to an average life of 20,000 hours if used for about 2.7 hours each day.

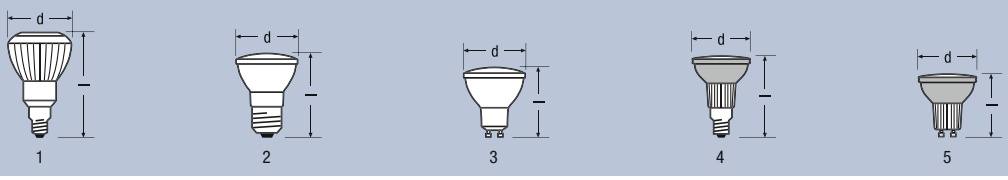


Product reference	Product number (EAN)		W [1]	lm [1]	cd [1]	[1]	l [mm]	d [mm]		No.
OSRAM PARATHOM® DECO CLASSIC A										
E27 – 220–240 V – Blister										
DECO CL A (frosted) WW	4008321**951748**	Warm White	2	50	–	–	109	55	6	1
E27 – 100–240 V – Blister										
DECO CL A (frosted) CC/CS	4008321**918307**	Color changing	0.5	–	–	–	109	55	6	1
DECO CL A (frosted) BL	4008321**918314**	Blue	1.2	2	–	–	109	55	6	1
DECO CL A (frosted) GN	4008321**918321**	Green	1.2	8	–	–	109	55	6	1
DECO CL A (frosted) RD	4008321**918338**	Red	1	8	–	–	109	55	6	1
DECO CL A (frosted) YE	4008321**918345**	Yellow	1	5	–	–	109	55	6	1
E27 – 220–240 V – Box										
DECO CL A (frosted) WW	4008321**951823**	Warm White	2	50	–	–	109	55	10	1
E27 – 100–240 V – Box										
DECO CL A (frosted) CC/CS	4008321**918253**	Color changing	0.5	–	–	–	109	55	10	1
DECO CL A (frosted) BL	4008321**918260**	Blue	1.2	2	–	–	109	55	10	1
DECO CL A (frosted) GN	4008321**918277**	Green	1.2	8	–	–	109	55	10	1
DECO CL A (frosted) RD	4008321**918284**	Red	1	8	–	–	109	55	10	1
DECO CL A (frosted) YE	4008321**918291**	Yellow	1	5	–	–	109	55	10	1
OSRAM PARATHOM® DECO CLASSIC B										
E14 – 220–240 V – Blister										
DECO CL B (frosted) WW	4008321**951762**	Warm White	2	50	–	–	104	35	6	2
E14 – 100–240 V – Blister										
DECO CL B (frosted) CC/CS	4008321**922724**	Color changing	0.5	–	–	–	104	35	6	2
DECO CL B (frosted) BL	4008321**922748**	Blue	1.2	2	–	–	104	35	6	2
DECO CL B (frosted) GN	4008321**922762**	Green	1.2	8	–	–	104	35	6	2
DECO CL B (frosted) RD	4008321**922786**	Red	1	8	–	–	104	35	6	2
DECO CL B (frosted) YE	4008321**922809**	Yellow	1	5	–	–	104	35	6	2
E14 – 220–240 V – Box										
DECO CL B (frosted) WW	4008321**951847**	Warm White	2	50	–	–	104	35	10	2
E14 – 100–240 V – Box										
DECO CL B (frosted) CC/CS	4008321**922625**	Color changing	0.5	–	–	–	104	35	10	2
DECO CL B (frosted) BL	4008321**922649**	Blue	1.2	2	–	–	104	35	10	2
DECO CL B (frosted) GN	4008321**922663**	Green	1.2	8	–	–	104	35	10	2
DECO CL B (frosted) RD	4008321**922687**	Red	1	8	–	–	104	35	10	2
DECO CL B (frosted) YE	4008321**922700**	Yellow	1	5	–	–	104	35	10	2

[1] All the technical parameters apply to the entire lamp. In view of the complex manufacturing process for light emitting diodes, the typical values given above for the technical LED parameters are merely statistical values that do not necessarily correspond to the actual technical parameters of an individual product; individual products may vary from the typical values.



	Product reference	Product number (EAN)		W [1]	lm [1]	cd [1]	[1]	l [mm]	d [mm]		No.
	OSRAM PARATHOM® DECO CLASSIC BA and BW										
	E14 – 220–240 V – Blister										
NEW	DECO CL BA (frosted)	4008321**980403**	Warm White	1.4	80	–	–	125	36.5	6	3
NEW	DECO CL BW (frosted)	4008321**980366**	Warm White	1.4	80	–	–	105	36.5	6	4
	OSRAM PARATHOM® DECO CLASSIC P										
	E14 – 220–240 V – Blister										
	DECO CL P (frosted) WW	4008321**951786**	Warm White	2	50	–	–	93	45	6	5
	E27 – 100–240 V – Blister										
NEW	DECO CL P (frosted) WW	4008321**597663**	Warm White	2	50	–	–	90	45	6	6
	DECO CL P (frosted) CC/CS	4008321**922526**	Color changing	0.5	–	–	–	90	45	6	6
	DECO CL P (frosted) BL	4008321**922540**	Blue	1.2	2	–	–	90	45	6	6
	DECO CL P (frosted) GN	4008321**922564**	Green	1.2	8	–	–	90	45	6	6
	DECO CL P (frosted) RD	4008321**922588**	Red	1	8	–	–	90	45	6	6
	DECO CL P (frosted) YE	4008321**922601**	Yellow	1	5	–	–	90	45	6	6
	E14 – 220–240 V – Box										
	DECO CL P (frosted) WW	4008321**951861**	Warm White	2	50	–	–	93	45	10	5
	E27 – 100–240 V – Box										
NEW	DECO CL P (frosted) WW	4008321**597632**	Warm White	2	50	–	–	90	45	10	6
	DECO CL P (frosted) CC/CS	4008321**922427**	Color changing	0.5	–	–	–	90	45	10	6
	DECO CL P (frosted) BL	4008321**922441**	Blue	1.2	2	–	–	90	45	10	6
	DECO CL P (frosted) GN	4008321**922465**	Green	1.2	8	–	–	90	45	10	6
	DECO CL P (frosted) RD	4008321**922489**	Red	1	8	–	–	90	45	10	6
	DECO CL P (frosted) YE	4008321**922502**	Yellow	1	5	–	–	90	45	10	6
	OSRAM PARATHOM® DECO Globe										
	E27 – 100–240 V – Blister										
	DECO G95 (frosted) CC	4008321**925541**	Color changing	1	–	–	–	142	95	6	7
	DECO G95 (frosted) BL	4008321**925602**	Blue	1.8	4	–	–	142	95	6	7
	DECO G95 (frosted) GN	4008321**925640**	Green	1.2	16	–	–	142	95	6	7
	DECO G95 (frosted) RD	4008321**925589**	Red	1.4	16	–	–	142	95	6	7
	DECO G95 (frosted) YE	4008321**925565**	Yellow	1.4	10	–	–	142	95	6	7
	E27 – 100–240 V – Box										
	DECO G95 (frosted) CC	4008321**925442**	Color changing	1	–	–	–	142	95	10	7
	DECO G95 (frosted) BL	4008321**925466**	Blue	1.8	4	–	–	142	95	10	7
	DECO G95 (frosted) GN	4008321**925480**	Green	1.2	16	–	–	142	95	10	7
	DECO G95 (frosted) RD	4008321**925503**	Red	1.4	16	–	–	142	95	10	7
	DECO G95 (frosted) YE	4008321**925527**	Yellow	1.4	10	–	–	142	95	10	7



Product reference	Product number (EAN)		W [1]	lm [1]	cd [1]	[1]	l [mm]	d [mm]		No.
OSRAM PARATHOM® DECO R50 40										
E14 – 220–240 V – Blister										
DECO R50 40 BL	4008321**925244**	Blue	6	–	290	15°	87	53.5	6	1
DECO R50 40 GN	4008321**925268**	Green	6	–	895	15°	87	53.5	6	1
DECO R50 40 RD	4008321**925282**	Red	6	–	480	15°	87	53.5	6	1
DECO R50 40 YE	4008321**925305**	Yellow	6	–	330	15°	87	53.5	6	1
E14 – 220–240 V – Box										
DECO R50 40 BL	4008321**925145**	Blue	6	–	290	15°	87	53.5	10	1
DECO R50 40 GN	4008321**925169**	Green	6	–	895	15°	87	53.5	10	1
DECO R50 40 RD	4008321**925183**	Red	6	–	480	15°	87	53.5	10	1
DECO R50 40 YE	4008321**925206**	Yellow	6	–	330	15°	87	53.5	10	1
OSRAM PARATHOM® DECO PAR16 10										
E27 – 100–240 V – Blister										
DECO PAR16 10 D	4008321**963468**	Daylight	2	80	290	20°	70	50	6	2
DECO PAR16 10 WW	4008321**963444**	Warm White	2	60	270	20°	70	50	6	2
DECO PAR16 10 BL	4008321**924445**	Blue	2	–	75	20°	74	50	6	2
DECO PAR16 10 GN	4008321**924469**	Green	2	–	143	20°	74	50	6	2
DECO PAR16 10 RD	4008321**924483**	Red	2	–	163	20°	74	50	6	2
DECO PAR16 10 YE	4008321**924506**	Yellow	2	–	60	20°	74	50	6	2
GU10 – 100–240 V – Blister										
DECO PAR16 10 D	4008321**963581**	Daylight	2	80	290	20°	60	50	6	3
DECO PAR16 10 WW	4008321**963567**	Warm White	2	60	270	20°	60	50	6	3
DECO PAR16 10 BL	4008321**924643**	Blue	2	–	75	20°	60	50	6	3
DECO PAR16 10 GN	4008321**924667**	Green	2	–	143	20°	60	50	6	3
DECO PAR16 10 RD	4008321**924681**	Red	2	–	163	20°	60	50	6	3
DECO PAR16 10 YE	4008321**924704**	Yellow	2	–	60	20°	60	50	6	3
OSRAM DECOSPOT® PAR16										
E14 – 100–240 V – Blister										
DECOSPOT PAR16 CC	4008321**905550**	Color changing	1	–	–	12°	77	50.7	6	4
DECOSPOT PAR16 WT	4008321**905635**	White	1	–	100	20°	77	50.7	6	4
DECOSPOT PAR16 RD	4008321**905529**	Red	1	–	50	12°	77	50.7	6	4
DECOSPOT PAR16 GN	4008321**905536**	Green	1	–	170	12°	77	50.7	6	4
DECOSPOT PAR16 BL	4008321**905543**	Blue	1	–	50	12°	77	50.7	6	4
GU10 – 100–240 V – Blister										
DECOSPOT PAR16 CC	4008321**905598**	Color changing	1	–	–	12°	57	50.7	6	5
DECOSPOT PAR16 WT	4008321**905642**	White	1	–	100	20°	57	50.7	6	5
DECOSPOT PAR16 RD	4008321**905567**	Red	1	–	50	12°	57	50.7	6	5
DECOSPOT PAR16 GN	4008321**905574**	Green	1	–	170	12°	57	50.7	6	5
DECOSPOT PAR16 BL	4008321**905581**	Blue	1	–	50	12°	57	50.7	6	5

[1] All the technical parameters apply to the entire lamp. In view of the complex manufacturing process for light emitting diodes, the typical values given above for the technical LED parameters are merely statistical values that do not necessarily correspond to the actual technical parameters of an individual product; individual products may vary from the typical values.

Professionals for special cases.

OSRAM LED lamps for special applications.

PARATHOM® SPECIAL T26 with its Daylight color can replace conventional T26 incandescent lamps in refrigerators and sewing machines. These PARATHOM® SPECIAL lamps from OSRAM have a very low energy consumption, long life and robust construction. And the OSRAM DULED® is the perfect combination of an economical compact fluorescent lamp and an LED night light. In addition to the general benefits of OSRAM LED lamps (see pages 4/5), here are the highlights of the individual products:

1

2

3

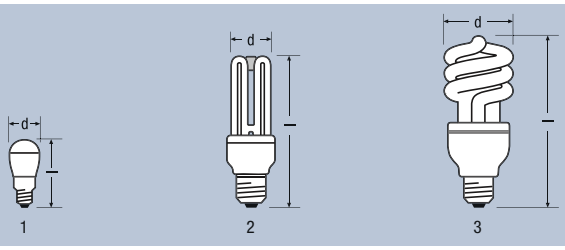
1 PARATHOM® SPECIAL T26

- *Ideal for use in refrigerators and sewing machines*
- *Average life of up to 10 years[1]*
- *Suitable for indoors and outdoors*
- *Robust and extremely small*
- *Daylight color suitable for use in refrigerators*

2/3 DULED® Stick and Twist shape

- *2in1: energy-saving lamp for general illumination and LED as a night light, orientation light or background light*
- *Average life of up to 6 years[2]*

[1] Corresponds to an average life of 10,000 hours if used for about 2.7 hours each day.
[2] Corresponds to an average life of 6,000 hours if used for about 2.7 hours each day.



Product reference	Product number (EAN)		W [1]	lm [1]	cd [1]	[1]	l [mm]	d [mm]		No.
OSRAM PARATHOM® SPECIAL T26 10/15										
E14 – 220–240 V – Blister										
SPECIAL T26 10 D	4008321**964984**	Daylight	0.7	35	–	–	61	26	9	1
SPECIAL T26 15 D	4008321**965028**	Daylight	0.8	65	–	–	61	26	9	1
E14 – 220–240 V – Box										
SPECIAL T26 10 D	4008321**964960**	Daylight	0.7	35	–	–	61	26	20	1
SPECIAL T26 15 D	4008321**965004**	Daylight	0.8	65	–	–	61	26	20	1
OSRAM DULED® Stick shape										
E27 – 220–240 V – Blister										
DULED 8 W/827 E27	4008321**202284**	Warm White	8	400/3	–	–	117	42	6	2
DULED 12 W/827 E27	4008321**222381**	Warm White	12	620/3	–	–	131	42	6	2
E27 – 220–240 V – Box										
DULED 8 W/827 E27	4008321**202314**	Warm White	8	400/3	–	–	117	42	10	2
DULED 12 W/827 E27	4008321**222350**	Warm White	12	620/3	–	–	131	42	10	2
OSRAM DULED® Twist shape										
E27 – 220–240 V – Blister										
DULED 15 W/827 E27	4008321**930330**	Warm White	15	830/3	–	–	124	52	6	3
DULED 21 W/827 E27	4008321**930354**	Warm White	21	1230/3	–	–	141	60	6	3
E27 – 220–240 V – Box										
DULED 15 W/827 E27	4008321**929372**	Warm White	15	830/3	–	–	124	52	10	3
DULED 21 W/827 E27	4008321**929396**	Warm White	21	1230/3	–	–	141	60	10	3

[1] All the technical parameters apply to the entire lamp. In view of the complex manufacturing process for light emitting diodes, the typical values given above for the technical LED parameters are merely statistical values that do not necessarily correspond to the actual technical parameters of an individual product; individual products may vary from the typical values.

Know-how: a brief LED glossary.

LED technology is complex. Knowledge of some of the basic concepts will go a long way to helping you understand the principles involved so we have prepared the following glossary for you.

Average lamp life:
is the average of the lives of individual lamps operated under standard conditions (50 % failure = average rated life).

Beam angle
indicates how broadly the light is emitted forwards from the lamp and is defined as the angle between two lines that extend from the LED lamp and intersect the points where luminous intensity is 50 % of its maximum value.
➔ Fig. 1

Binning
In the production of modern high-output LEDs manufacturing tolerances are unavoidable even with the smallest fluctuations in the parameters. The semiconductors are therefore sorted and classified after production according to their color values and efficiencies. All the LEDs that have similar values are placed in the same bin. The narrower the tolerances the greater the quality of systems that consist of more than one LED.

Candela
(Latin for tallow candle) is the photometric SI base unit for luminous intensity and is the luminous flux emitted by a light source in a particular direction (the luminous flux lm emitted in a particular direction in a solid angle sr). The symbol is cd.

Costs
LED lamps are still more expensive to purchase than lamps based on other technologies. Over their lifetime however they are already a cost-effective alternative to incandescent and halogen lamps (➔ TCO)

Color spectrum & definition of color temperature
The color spectrum is that part of the electromagnetic spectrum that can be perceived by the human eye without any technical aids (approx. 380 to 750 nm). The color temperature is a measure of the color impression of a light source measured in kelvin (K). For LED lamps the color temperature typically ranges from 2700 K to 6500 K.
➔ Fig. 2.1 and 2.2, page 22

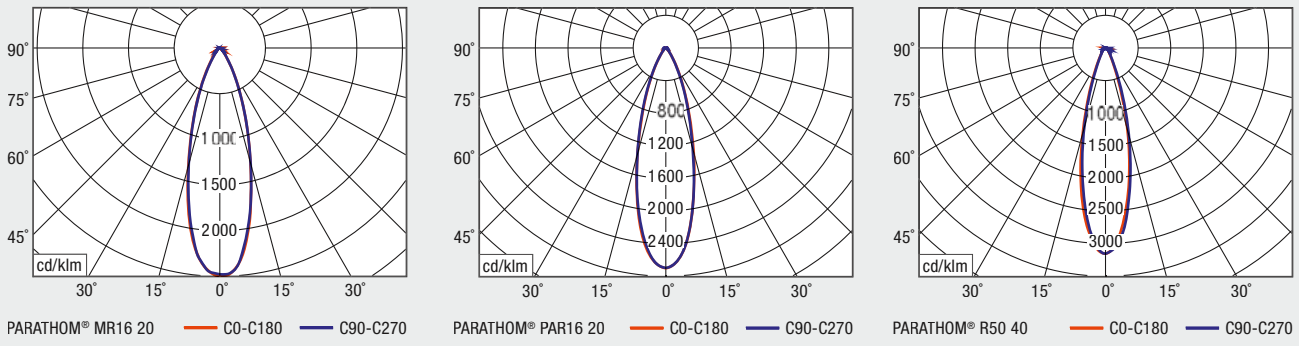


Fig. 1: *OSRAM LED reflectors have a very similar beam characteristic to comparable halogen and incandescent lamps.*

CRI (Color Rendering Index)
indicates the quality of color rendering of artificial light sources. The symbol used is R_a. The maximum value is 100, which means no falsification of colors by the light source. Incandescent lamps can achieve this value. LED lamps have a typical value of R_a 80, but can achieve R_a 90 and more.

Dimmability
The OSRAM range includes dimmable LEDs. Most of the conventional dimmers available on the market (leading-edge/trailing-edge phase dimmers) have been designed for incandescent lamps and are therefore rated for higher minimum loads (W) than LED lamps offer. There may therefore be some restrictions in terms of functionality.

Drivers
Circuits that transform line voltage into a constant current for operating the LEDs.

Heat Sink
is the enclosure that serves to remove/radiate the heat from the LED lamp. Materials with good thermal conductivity are used here to transfer the heat generated inside the lamp to the surrounding air.

Infrared radiation
(near IR radiation) comprises electromagnetic waves in the spectral range between visible light and long-wave terahertz radiation. High doses of near infrared radiation in particular with a wavelength of 780 to 3000 nm penetrates deep into and under human skin and can lead to health problems. OSRAM LED lamps do not emit any near IR radiation.

LED
(Light Emitting Diode) is an electronic semiconductor component. If current flows through the diode it emits light with a wavelength that depends on the semiconductor material.

Lens
A lens is an optical component with two refractive surfaces, at least one of which is either convex or concave. In LED lamps the function of a lens is to focus or disperse the light and therefore define the beam angle.

Lifetime
LED lamps have extremely long lives. However their light output diminishes over time (see Fig. 3). OSRAM defines the lifetime of its LED lamps as the operating time in which the LED lamps produce more than 70 % of their initial light output. In doing so, OSRAM is already following the recommendations of the International Electrotechnical Commission (IEC) which is currently working on an international standard based on this threshold value.
➔ Fig. 3

Lumen
(Latin for light or torch) is the photometric unit of luminous flux. Luminous flux is a measure of the entire visible radiation emitted by a radiation source.

Recycling
OSRAM LED lamps are extremely durable and do not contain any mercury. However because they contain electronic components they must be disposed of as waste electrical and electronic equipment at the end of their life.

Reflector
returns light beams at certain angles in the same way as a curved mirror. Reflector lamps such as PARATHOM® PAR16 or MR16 are equipped with such a reference or a lens.

Resistance to switching transients
Basically, LED lamps cannot be switched on and off indefinitely. OSRAM LED lamps can tolerate 100,000 switching cycles and more.

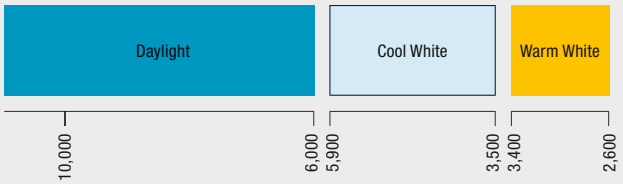


Fig. 2.1: *OSRAM offers three different color temperatures (K): Warm White, Cool White and Daylight.*

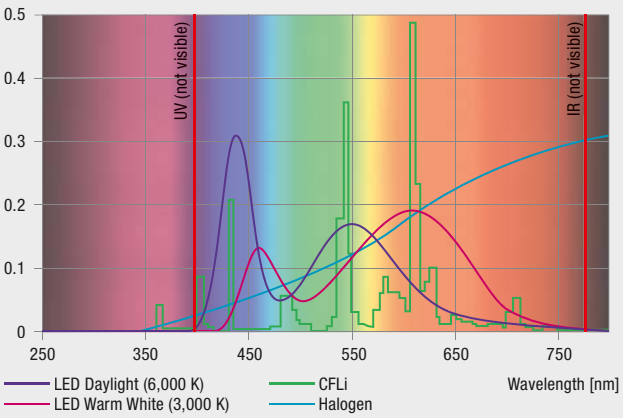


Fig. 2.2: *Unlike other technologies the color spectrum of LED lamps is entirely in the visible range.*

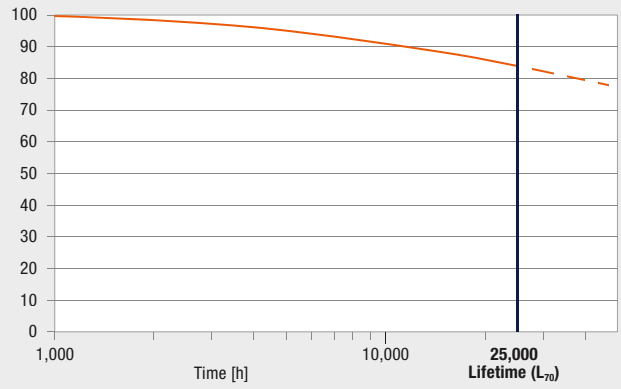


Fig. 3: *Luminous flux of an LED lamp over time (with OSRAM Golden DRAGON® Plus LED) with a life of 25.000 hours. OSRAM defines end of life as 70 % of the original luminous flux (L_{70}).*

T_c-Point

is located at a particular point on the casing of the lamp to provide a simple way to determine the thermal behavior of the lamp in a luminaire. Compliance with the Tc point temperature ensures that no component in the control gear is exposed to excessive heat. The Tc point is also used to determine the temperature reserves in a luminaire and the maximum ambient temperature in which the luminaire can be used. OSRAM LED lamps are typically designed for an ambient temperature of –20 °C to +40 °C.

TCO (Total cost of ownership)

TCO includes all the costs over the entire life of a lamp or for a particular operating time. It covers procurement costs, relamping costs and operating costs (power). LED lamps now pay for themselves through their long life and low power consumption.

➔ Fig. 4

Thermal output

In contrast to conventional light sources, LEDs convert a high proportion of electrical power into visible light. However even with modern LED lamps a large proportion of the energy consumed is emitted in (unwanted) heat. Nevertheless, there is enormous potential in LED technology for reducing this still further (see also Heat Sink, T_c point).

➔ Fig. 5

Transformers

Low-voltage lamps need an external transformer. A distinction is made between conventional (magnetic) control gear (CCG) and electronic control gear (ECG). Further information can be found in the technical data sheets for each product.

UV radiation

is electromagnetic radiation that is invisible to the naked eye and may cause health problems. OSRAM LED lamps do not emit any UV radiation.

Volt

is the derived SI unit of electrical voltage. The symbol is V. Low-voltage LED lamps (12 V) operate with transformers. High-voltage LED lamps can be operated on line voltage (220–240 V).

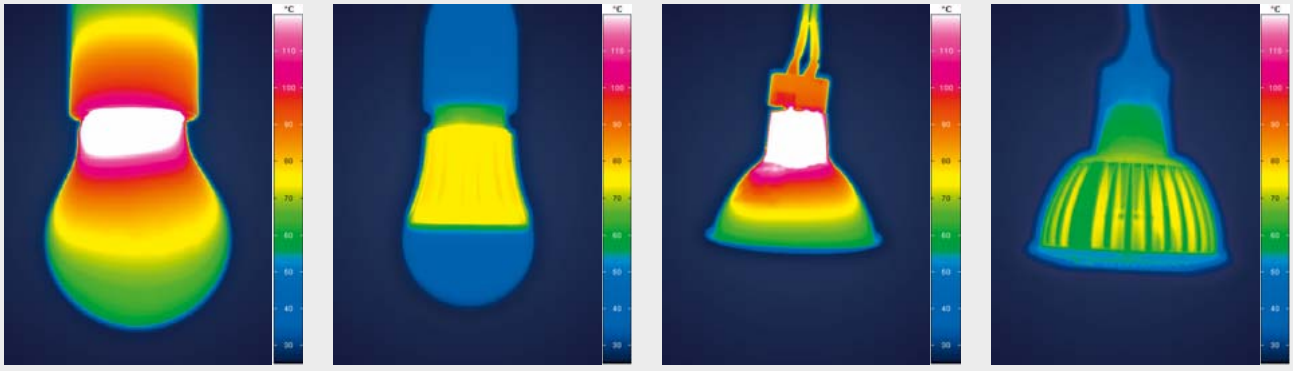
Watt

is the SI unit of power and was used for incandescent lamps as an indication of their light output. Since modern energy-saving lamps and LED lamps consume far less power to achieve the same brightness, however, the wattage is no longer as meaningful. The lumen value is now used instead.

Wattage comparison according to ErP

The EU directive for non-directional light (ErP DIM I) requires a certain luminous flux from LED lamps to make a comparison with incandescent lamps. Details are given in the table below:

➔ Fig. 6



Incandescent lamp 40 W | *OSRAM PARATHOM® CLASSIC A 40* | *Halogen lamp 20 W* | *OSRAM PARATHOM® MR16 20*

Fig. 5: *These thermographic images show that LED lamps emit very little heat.*

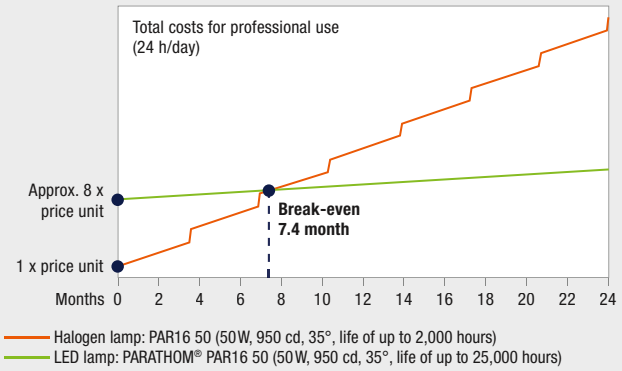

Total costs for professional use
(24 h/day)
Approx. 8 x
price unit
1 x price unit
Break-even
7.4 month
Months 0 2 4 6 8 10 12 14 16 18 20 22 24
Halogen lamp: PAR16 50 (50 W, 950 cd, 35°, life of up to 2,000 hours)
LED lamp: PARATHOM® PAR16 50 (50 W, 950 cd, 35°, life of up to 25,000 hours)

Fig. 4: *Sample TCO for a 50 W halogen lamp compared with a PARATHOM® LED lamp. An LED lamp in a professional application can pay for itself after only 7.4 months.*

Incandescent lamp wattage in W	Typical luminous flux of an OSRAM incandescent lamp in lumen	Required luminous flux of LED lamps as per ErP DIM I in lumen
15	90	136
25	220	249
40	415	470
60	710	806
75	935	1,055
100	1,340	1,521
150	2,160	2,452
200	3,040	3,452

Fig. 6: *The light values required by the EU that are needed to refer to comparable incandescent lamps are higher than those of the incandescent lamp to be replaced. Lumens are therefore more and more important as a means of comparing lamps and their light output.*

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